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Some Interesting Fern Papers in Rhodora

R. C. BENEDICT

During 1915, there were published in Rhodora four papers of especial interest to members of the American Fern Society. The papers were written by Prof. Fernald in connection with his study of the flora of New England and northeastern North America, and contain changes in the naming of some well known species.

The first paper¹ deals with the North American representatives of *Dryopteris spinulosa* var. *dilatata*. On the basis of the pale scales of the American form called var. *dilatata*, together with the glandless indusia, and other facts, the conclusion is drawn that the so-called *dilatata* of eastern North America should be considered as not so closely related to true European *dilatata* as it is to the so-called species, *spinulosa*. His conclusions are partly expressed in the following words: "Except in stature, broader fronds, and more elongate irregularly triangular lower pinnae, the plant is close to *Dryopteris spinulosa* and in our northern forests certainly grades into it. As a variety, however, it deserves recognition as *Dryopteris spinulosa* (Müll.) Kuntze, var. *americana* (Fischer) Fernald." *Aspidium spinulosum*, var. *dilatatum*, forma *anadenium* Robinson is cited as a synonym. True *dilatata* is recognized from the Pacific coast.

¹ Rhodora 17: 44-48. F 1915.

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The reviewer is especially interested in this group of ferns, and has been making it the object of special study for ten years intermittently. As a result of this study he is obliged to dissent emphatically from some of the conclusions indicated above. The statement that *dilatata* grades into *spinulosa* is, the writer believes, entirely incorrect. The *spinulosa* group is and has been correctly divided into its three constituent forms, *spinulosa*, *intermedia*, and *dilatata*, by general usage in this country. All three forms are well distinguished, specifically, the writer believes.

In its typical development, the distinguishing features of Fernald's var. *americana* as distinguished from typical European *dilatata* are found only in its concolorous scales as opposed to dark striped ones, and its glandless indusia as opposed to glandular indusia. Now there can be no doubt that *dilatata* of eastern North America differs in these particulars from typical *dilatata* of Europe, and may well deserve to be separated as a variety of *dilatata*² but that these characters constitute sufficient difference to separate it from *dilatata* entirely and attach it to *spinulosa* seems far from established.

There is scarcely space here for an extended discussion at this time, particularly as the writer hopes to indulge in an extended one in connection with a paper on the *spinulosa* group some time this year. It may be of interest, however, to record some observations made at the Gray Herbarium on the material Prof. Fernald had studied and identified.

1. *Americana* is not limited to America but occurs in Eurasia. That is, in the reviewer's opinion, *dilatata* is represented in eastern North America almost entirely by the form with pale scales and glandless indusia, but this same form of *dilatata* also occurs sparingly throughout its whole range. The leaf form is always the same.

² So separated, it should be called *Dryopteris dilatata* var. *americana* (Fischer) comb. nov.

2. A considerable number of leaves, without petiole bases, and therefore unidentifiable on scale characters, were placed in the *americana* covers, presumably on industrial characters. The scale character, however, is too uncertain in this group to make it certain that one or more of these leaves might not be glandless and at the same time have dark scales.

A further argument for keeping together *dilatata* and var. *americana* so-called is found in the fact that both are alpine or arctic forms, i. e., they require a cold climate. In Labrador and Greenland it is cold enough at sea level, but farther south in Europe and in America, *dilatata* finds suitable coolness only on mountains. This certainly is not true of *spinulosa* although this form may also occur in cold as well as warmer regions. The intergrading so called between these two is explained by the fact that in the north *dilatata* is sometimes stunted and no larger than *spinulosa*, but the two forms are separable on other grounds despite that, and the reviewer believes that Prof. Fernald has identified as *spinulosa* some leaves which are unmistakably small *dilatata*.

The second paper³ is also concerned with a plant which is part of a group to which the writer has given considerable study but in this case he does not find himself obliged to dissent. *Botrychium angustisegmentum* (Pease & Moore) Fernald is recognized as a species distinct from *B. lanceolatum* on the basis of spore and sporangium characters, different life zone, and generally slenderer character.

It is a fact that in the case of practically all species of *Botrychium* recognized as common to Europe and America, the European plants are almost invariably thicker and fleshier. If similar forms occur in America they are usually found in the northern portion of the continent. A good illustration is found in the case of

³ Rhodora 17: 87, 88. Ap 1915.

B. Lunaria, European and in boreal America. A slender form sometimes identified as *Lunaria* is more properly separated as *onondagense*. The same is true for *matricariaefolium*. The writer retained this name for the American plant in the North American Flora because there was not available sufficient material from Europe to justify its separation at that time but it is probably a case similar to that of *lanceolatum* and *angustisegmentum*. It is, however, a mistake, the reviewer believes, to use for this form the name *ramosum* as Dr. Underwood did at one time, and as Dr. Robinson does in the new Gray Manual. The name *ramosum* was based on an abnormal form of another species, as Davenport has pointed out, and as the reviewer took pains to verify some years ago. The form should be called either *matricariaefolium* or *neglectum*.

The fourth paper⁴ may well be dealt with before the third because it deals with a case similar to that of *Botrychium angustisegmentum* as compared with *B. lanceolatum*. In this case there is pointed out the differences between the European and American forms commonly known as the ostrich fern, *Matteuccia Struthiopteris*. Prof. Fernald concludes that the American form should bear a distinct name as a species and designates it *Matteucia nodulosa* (Michx.) Fernald. The differences are found in the size, cutting, and habit of growth of the two sorts, and also in the fact that the European form has black scales on the petioles and the American form pale brown ones.

This brings to mind the separation of the American and European royal ferns as *Osmunda spectabilis* and *O. regalis*. It is quite possible that this is justified but satisfactory characters have not yet been pointed out, and the problem is complicated by the fact that *regalis* or some related form is distributed throughout the

⁴ Rhodora 17: 161-164 S 1915.

American tropics. All these forms, including the European plant, must be studied together before a satisfactory conclusion as to their separateness can be reached. Only on the basis of the "made in America" slogan can they be distinguished at present.

The third paper⁵ chronologically has the title "The American variations of *Lycopodium annotinum*." Three varieties besides the typical form are recognized, one, *acrifolium*, being new. The typical form is transcontinental, being distributed from Newfoundland to Alaska and from New York to Washington, also in Eurasia. The variety, *acrifolium*, is cited as from Newfoundland and Connecticut to Michigan, and also in Siberia. It may be pointed out that the differences between these two are exactly analogous to those existing between *L. lucidulum* and its var. *porophilum*. "Varieties *alpestre* and *pungens* seem to be the alpine and boreal extremes of the two woodland plants of more temperate habits, true *L. annotinum* and var. *acrifolium*." It is also noted that "The ranges of these varieties thus fall essentially into the definite groupings—Europe and western America, eastern America and Asia—already familiar in hundreds of cases."

BROOKLYN BOTANIC GARDEN.

An Interesting Hybrid

AMÉDÉE HANS.

A very interesting case of accidental hybridization happened among my seedlings some time ago. In a little frame where I used to raise ferns from spores I had, among others, *Scolopendrium* and *Asplenium Trichomanes*. In the *Scolopendrium* pot, by accident, grew a

⁵ *Rhodora* 17: 123-125. Je 1915.